that is, a cubic meter of solid coal will weigh about 1200 k<r; a cubic meter of coal in small pieces will weigh about 700 kg. It follows that the volume of the spaces filled with air will be

^200 700

equal to — J9QQ~ — ^ 0 ^{m3} 42 and that the total cross-sectional

area of these interstices will be equal to 0 in^2 42 per square meter. As the total area of the grate is 1 m^2 80; the area of the air spaces will be

$$0.4X2X1.\ 80 = 0\ m^2\ 750$$

and the velocity of the air passing through them

will be

y_3 = ' = 0 m 68 per second,

from which A_3 = 0 m 0235 W and *83* = 1.29X0.0235 = 0 mm 03 of water; and as the velocity is lost three times, once for each layer of the fuel bed :

$3 = 0.03X3 = 0 mm 09 of water column.
(2>

The velocity of the gaseous products of combustion above the fuel bed may be determined in the following manner:

y_4 = ' = 1 m 54 per second,

from which

L n iir i * 0.115X1.326(3) A
Aor7r or
A4~0 m 115 and 54 = - P-T^ - = 0 mm °275 of water.
o.o«7
= 3 m

The velocity of the hot gases over the bridge wall

3 45
~~423x2~~

(1) Refer to Appendix III for heads required for various velocities.

(2) *Note by English translator.* — The foregoing is not exactly correct, but it illustrates the method to be followed. The lower layer of the fuel bed will be composed mostly of ashes and a small amount of burning fuel. The second layer will be burning fuel and the third layer will be composed of burning coal and partially burning or fresh fuel. Another factor that has not been con-

sidered above is the increase in temperature of the air and its change into the gases of combustion. A considerable volumetric expansion will result in increased resistance to the passage of the air.

[3] This is the weight of 1 cubic meter of the products of combustion.